

Barometer Calibration at the SLR Riga 1884 Current Status

K. Salmins, J. del Pino, J. Kauliņš

Institute of Astronomy, University of Latvia, Riga, Latvia

Official Barometric Sensors at the SLR 1884 Riga

- 1987/09/01 – 2007/03/30: Aneroid Barometer-Paulin VBM2. (Ericsson), Accuracy – 0.2 mb.
- 2007/03/30 - Present: Vaisala WXT510 meteorological sensor, pressure measurement accuracy – 0.1 mb.
- 2016: an auxiliary Vaisala PTU300 Pressure, Humidity and Temperature Transmitter is installed at the SLR building. Accuracy - 0.1 mb.
- The calibrations were done using the GE DPI 141 precision barometric pressure indicator. Accuracy - 0.01 mb.

Barometric Sensors at the SLR 1884 Riga



Vaisala WXT510



Vaisala PTU300





Vaisala WXT510 Location



Marking the PTU300 sensor height

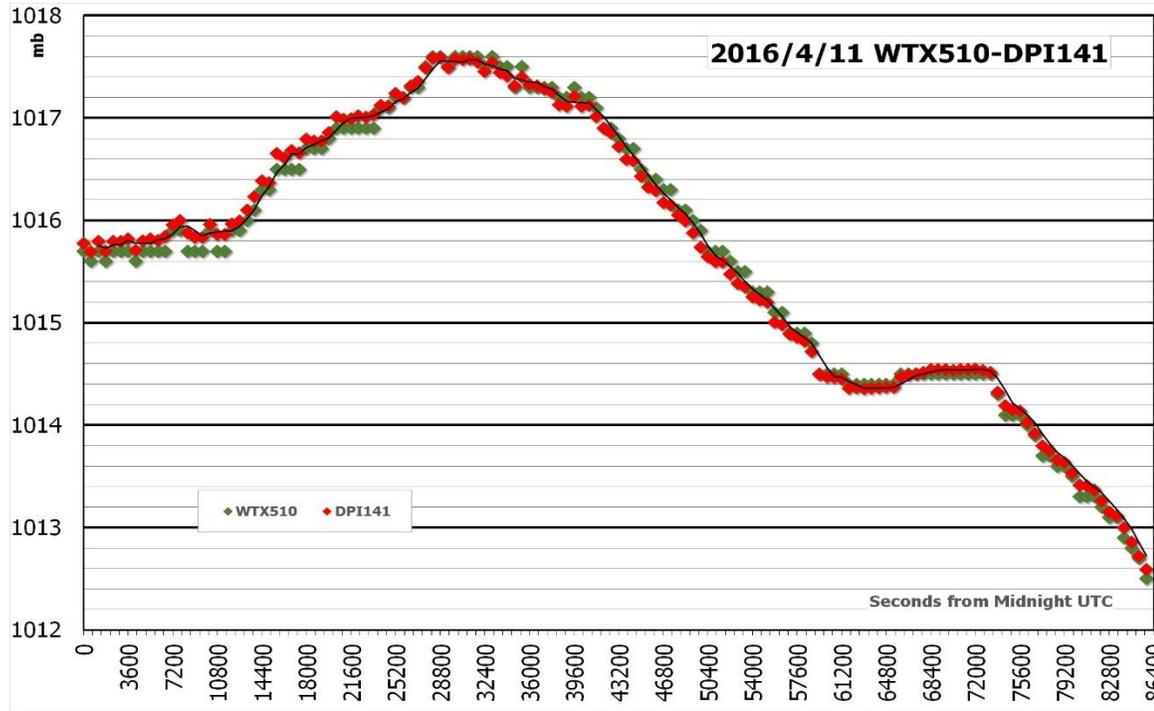


Marking the WXT510 sensor height

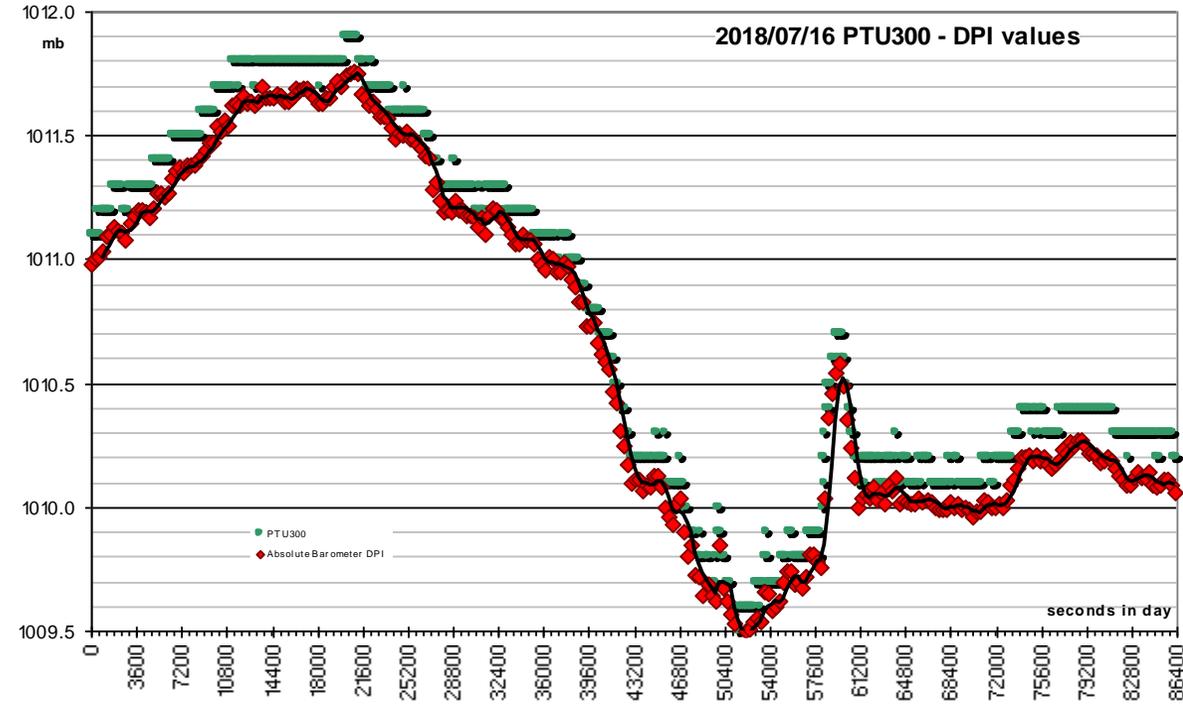


Levelling DPI141 sensor

Calibration Results

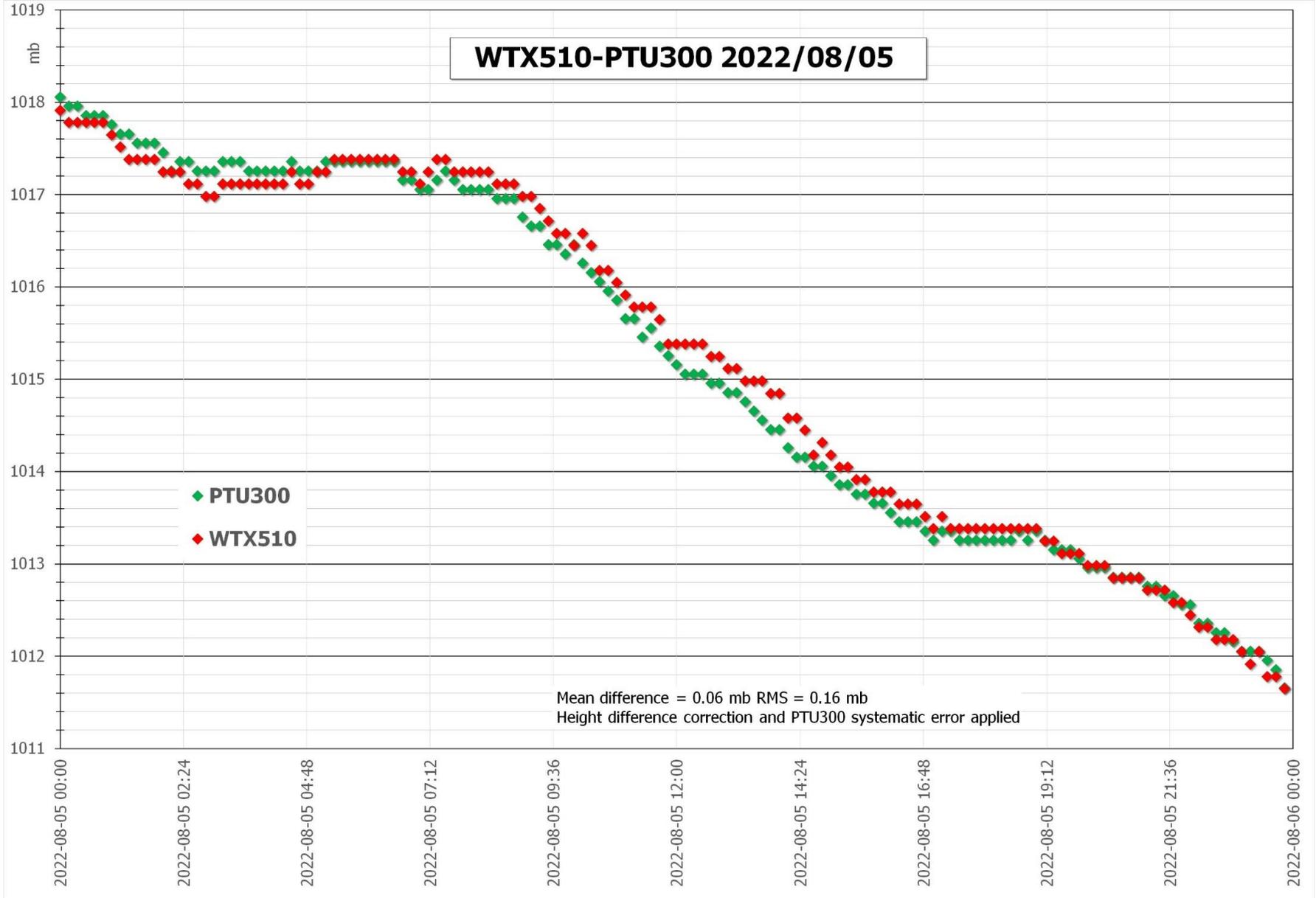


Temperature Range for the day: +2.7 - +20.6
 Total of days: 27 (between 2016/04/09 to 2016/08/20)



Temperature Range for the day: +16.3 - +25.5
 Total of days: 18 (2018/07/07 15h – 2018/07/26 9h)

Sensor	Mean Difference mb	Error mb
WTX510	+0.04	± 0.08
PTU300	+0.12	± 0.04



Temperature Range: 16.2 - 32.3 °C

Current Activities

- Calibration Paulin & Soviet Aneroids.
- 1 daily measurement ~midday, working days until summer 2023.
- Values compared against WTX & PTU.
- Possible student summer internship work.



Conclusions

- Since 2007 we don't have a large systematic error in atmospheric pressure measurements. The average measurement error during is less than 0.1hPa, sometimes pressure readings may exceed values 0.1hPa, but not on the regular basis.
- Pressure sensor preferably should operate within constant temperature
- Preferably have more than one pressure sensor

Future Activities

- Repeating the calibrations against a reference barometer and optionally send WXT 510 for calibration and upgrade
- Installing a new meteostation following WMO recommendations and to compare with WXT 510 to determine other measurement biases e.g. temperature and to record wind and precipitation measurements.
- To purchase an absolute barometer as the main pressure measuring unit.

Thank you for your attention!

Acknowledgments

Many thanks to the Potsdam SLR team for lending the DPI 141